STATE OF MISSOURI
DEPARTMENT OF NATURAL RESOURCES
AIR POLLUTION CONTROL PROGRAM
205 JEFFERSON STREET, P.O. BOX 176
JEFFERSON CITY, MISSOURI 65102

EMISSIONS INVENTORY QUESTIONNAIRE (EIQ)

FORM 2.0 EMISSION POINT INFORMATION

SHADED AREAS FOR OFFICE USE ONLY

FACILITY NAME	FIPS COUNTY NO.	PLANT NO.	YEAR OF DATA

[1] POINT IDENTIFICATION

POINT NO	AIRS ID-PT	SIC CODE	POINT DESCRIPTION

SOURCE CLASSIFICATION CODE (SCC)	EMISSION FACTOR UNITS	NUMBER OF SCCs USED WITH THIS POINT	SEG.NO

SCC DESCRIPTION

[2] STACK/VENT PARAMETERS

STACK NO.	AIRS ID-ST	HEIGHT (FT)	DIAMETER (FT)	**For a non-circular stack: Diameter = (1.128A)^1/2 (A = Cross Sectional Area in sq. feet)**

TEMPERATURE (F)	VELOCITY (FT/MIN)	FLOW RATE (CU FT/MIN)	LIST OTHER PINTS SHARING THIS STACK

[3] AIR POLLUTION CONTROLS

DEVICE NO.	DEVICE CODE	DESCRIPTION OF CONTROL DEVICE	CAPTURE EFFICIENCY (%)	CONTROL DEVICE EFFICIENCY (%)						
				PM10	SOx	NOx	VOC	CO	LEAD	HAPs

[4] OPERATING RATE/SCHEDULE

ANNUAL THROUGHPUT	UNITS	HOURS/DAY	JAN-MAR (%)	APR-JUN (%)
		DAYS/WEEK		
MAXIMUM HOURLY DESIGN RATE	UNITS/HR	WEEKS/YEAR	JULY-SEP (%)	OCT-DEC (%)

EMISSIONS CALCULATIONS

SOURCE OF EMISSION FACTOR : (LIST BELOW IN [6])

1 CEM **3 MASS BALANCE** **5 OTHER** **## WORKSHEET NUMBER**
2 STACK TEST **4 AP-42 OR FIRE** **6 ENG CALC** **(PLEASE IDENTIFY WORKSHEET)**

AP 42/OTHER REFERENCE	[5] LIST OTHER WORKSHEETS

AIR POLLUTANT	[6] SOURCE	[7] EMISSION FACTOR (LBS/UNIT)	[8] ASH OR SULFUR (%)	[9] OVERALL CONTROL EFFICIENCY (%)	[10] ACTUAL EMISSIONS (TONS/YR	MAXIMUM HOURLY (LBS/HR)	POTENTIAL CONTROLLED (TONS/YR)	POTENTIAL UNCONTROLLED (TONS/YR)
PM10								
SOx								
NOx								
VOC								
CO								
LEAD								
HAPs								

DUPLICATE THIS FORM AS NEEDED.

INSTRUCTIONS
FORM 2.0 EMISSION POINT INFORMATION

This form is **REQUIRED** of all facilities.

This form must be completed for each reportable emission point (200 lbs. or more of criteria pollutants per point) shown on Form 1.1, Process Flow Diagram, and Form 1.2, Summary of Emission Points (see definition in Glossary of Reporting Level). A separate Form 2.0 must be completed for each fuel type used (or capable to use) for each emission point even if **no annual throughput.**

The authorized facility representative signing the EIQ is responsible for ensuring all submitted EIQ forms are filled out completely. Incomplete forms will be returned and the program will note that a complete submittal was not received. Items that clearly do not apply may be left blank, but all others must be filled in. Required items include, but are not limited to, SCC codes, throughput values, maximum hourly design rates, emission factors, source and reference for emission factors and actual emissions. All units must be consistent.

Complete **Facility Name, County Number, Plant Number** and **Year of Data.**

1) POINT IDENTIFICATION

Point Number: This identification number must match the emission point identification number listed on Forms 1.1 and 1.2. The same point number must be used on any other form(s) associated with this emission point.

AIRS ID - Pt.: This is a three-character emission point identifier assigned by APCP staff. It is used as the Point Number in the Environmental Protection Agency's Aerometric Information Retrieval System - Facility Subsystem database. Once this number is assigned to an emission point, it should remain constant from year to year, even if the Point ID supplied by the facility is changed.

Standard Industrial Classification (SIC) Code: The federal government uses this code. Enter the industry code specific to this emission point description.

Point Description: This description must uniquely identify the process associated with this emission point.

Source Classification Code (SCC): This code identifies the type of combustion or processes associated with an emission point. SCCs specific to your facility are contained in AP-42 (U.S. Environmental Protection Agency (EPA) *Compilation of Air Pollution Emission Factors)* or FIRE (Factor Information and Retrieval System). **This is a required field.** If you cannot locate a SCC specific for your process, use a SCC most closely associated to your process.

Emission Factor Unit: SCC emission factor units, Annual Throughput units, and Maximum Hourly Design Rate (MHDR) units must be the same and must correspond to the SCC Emission Factor Unit. For example, if the SCC units are in 1000 gallons, then the Annual Throughput and MHDR must also be in 1000 gallons.

Number of SCCs Used with this Point: Specify the number of SCCs used with this emission point. This number will be the same as the number of copies of Form 2.0 having the same point number. An example of an emission point with multiple SCCs is a boiler burning two different types of fuel. Each fuel type would require a different SCC and a separate Form 2.0 for each fuel used.

Seg. No.: This is a two-digit number assigned by APCP used uniquely to identify processes associated with an emission point. Generally, if emission point EP01 has three processes associated with it, then Seg. No.'s 01, 02 and 03 will be assigned to those processes. The Segment Number is used in the Environmental Protection Agency's Aerometric Information Retrieval System - Facility Subsystem database. Once this number is assigned to a process, it should remain constant from year to year, even if the SCC changes.

SCC Description: Source Classification Code is an eight-digit number associated with a unique process from which air pollutants are emitted. Example: An industrial space heater that uses natural gas as a fuel has an SCC number of 1-05-001-06.

2) STACK/VENT PARAMETERS

This section should be left blank for emission points that do not vent through a stack. Height and diameter must be provided when completing this section.

Stack Number: This identification number should be your stack, vent or other identification number that uniquely identifies the stack.

AIRS ID - St.: This is a three-digit stack identifier supplied by APCP staff. It is used as the Stack Number in the Environmental Protection Agency's Aerometric Information Retrieval System - Facility Subsystem database. Once this number is assigned to a stack, it should remain constant from year to year, even if the stack number supplied by the facility changes.

Height (Stack Feet): This is the vertical distance between ground level and the point of exhaust into the ambient air.

Diameter (Feet): This is the inside diameter of the top of a circular stack exit. For a non-circular stack exit, use an equivalent diameter calculated from the cross-sectional area. This equivalent diameter, d, equals the product of the square root of 1.128 and A. That is, $d = (1.128 \times A)^{1/2}$, where A is the cross-sectional area in square feet. The carat symbol, ^, indicates that ½ is an exponent.

Temperature (F): This is the exhaust temperature in degrees Fahrenheit for this stack. If the exhaust is discharged at ambient temperatures, enter 77 degrees F.

Velocity (Feet/Minute): This is the exhaust gas velocity from the stack expressed in feet per minute. This figure can be calculated from the flow rate by dividing the actual cubic feet per minute of flow rate by the cross-sectional area of the stack.

Flow Rate (Cubic Feet/Minute): This is the exhaust gas volume from the stack at the actual operating temperature. Flowrates can be obtained from manufacturers' fan output information in some cases (rated flowrate on the equipment). If a stack exit velocity is known through a test, then the stack cross-sectional area can be multiplied by the velocity to get the flowrate.

List other Points Sharing this Stack: Provide a list of the emission points vented through this stack.

3) AIR POLLUTION CONTROL EQUIPMENT

If there are more than two control devices operative at an emission point, use Form 2.0C, Control Device Information, to describe the additional devices.

Device Number: This is the number you select uniquely to identify the air pollution control device. This device number should be the same as that shown on Form 1.1, Process Flow Diagram, for this equipment.

Device Code: This three-digit control device code is found in the Control Device Listing included with this instruction packet. Use the code that best describes the control equipment.

Description of Control Device: Describe the control equipment used to reduce or remove air contaminants. The type of equipment (Example: cyclone, baghouse, etc.) is most important, but brand and model numbers are also appropriate.

Capture Efficiency (%): This is the amount of material taken in by the control device. Capture efficiency will be applicable to emission points controlled by air pollution control devices and are not fully enclosed. Capture efficiency is not applicable to emission processes with water suppressant or water spray controls, such as haul roads.

Guidelines for Determining Capture Efficiency of a Control Device at an Emission Point.

Capture efficiency is determined at each emission point controlled by a control device, regardless of the location of the control device. If a facility has a single central control device, and that device takes in pollutants from multiple emission points, a capture efficiency must be determined for each point. Please use the following hierarchy to determine capture efficiency. The APCP reserves the right to require a facility to change its reported capture efficiency.

1) Testing: Testing is the best method of determining capture efficiency. This testing could have been done when the control device was installed, or afterwards. If this method is used to determine capture efficiency, the documentation verifying the capture efficiency needs to be supplied with the EIQ. If new testing is done, the APCP needs to contacted, so that the proper procedures can be followed.

2) Engineering Calculations/Drawings: If control device testing has not been done, then engineering calculations, drawings or estimations can be supplied with the EIQ to determine the capture efficiency at an emission point.

3) EPA Documents: EPA documents can be used by a facility if the above two methods are not possible. Examples of acceptable EPA documents are the AP-42, AP-42 Background Documents, and Control Technique Guidelines. These documents need to be cited in the EIQ as the source of the capture efficiency determination.

4) Default 50% Capture Efficiency: If both testing and engineering calculations are not possible, and EPA documents are not available, then a default 50% capture efficiency may be used. Documentation will need to be provided stating why the capture efficiency at the emission point was not able to be determined.

Control Device Efficiency (%): The control efficiency entered must be within the acceptable range for this control device. Refer to or must match the control device efficiency % in construction and/or operating permit.

4) OPERATING RATE/SCHEDULE

Annual Throughput: This is the amount of material used, processed or produced in the process associated with the emission point during the calendar year.

Annual Throughput Units: SCC emission factor units, Annual Throughput units, and Maximum Hourly Design Rate (MHDR) units must be the same. For example, if the SCC units and Annual Throughput units are in 1000 gallons, the MHDR must also be in 1000 gallons.

Maximum Hourly Design Rate: This entry is the maximum hourly operating rate possible for the equipment associated with the emission point. To calculate the rate for combustion-related equipment, follow the applicable instructions on Form 2.1, Fuel Combustion Worksheet.

Maximum Hourly Design Rate Units: SCC emission factor units, Annual Throughput units, and Maximum Hourly Design Rate (MHDR) units must be the same and must correspond to the SCC Emission Factor Unit. For example, if the SCC units are in 1000 gallons, then the Annual Throughput and MHDR must also be in 1000 gallons.

Hours/Day: This figure is the normal number of hours per day that the equipment or process associated with the emission point was in operation.

Days/Week: This figure is the normal number of days per week that the equipment or process associated with the emission point was in operation.

Weeks/Year: This figure is the normal number of weeks per year that the equipment or process associated with the emission point was in operation.

Jan-Mar(%), Apr-Jun(%), Jul-Sep(%), and Oct-Dec(%): For each of the four calendar quarters, specify the percentage of total Annual Throughput attributable to each quarter. Estimates are acceptable. The entries for all four quarters must total 100%.

EMISSIONS CALCULATIONS

5) List other Worksheets (used with this Form): List all worksheets (Form 2.1 - Form 2.T) associated with this Form 2.0.

6) Source of Emission Factor: Indicate the number code of the source of the emission factor for each pollutant emitted at a point. Use the following hierarchy in determining what to use as the source of the emission factor. If information for a source is not available, then the next source on the hierarchy may be used in its place. The Air Pollution Control Program reserves the right to require a facility to use a specific source.

1) Continuous Emission Monitoring (CEMS);
2) Stack Testing;
3) Material/Mass Balance;

If "**4**" (AP42) or "**5**" (Other) is selected, the **AP42/Other Reference** block **MUST** be completed. List the section, table, figure number, title, etc. that identifies the emission factor source.

4) AP-42 (Environmental Protection Agency (EPA) *Compilation of Air Pollution Emission Factors)* or FIRE (Factor Information and Retrieval System);
5) Other EPA approved documents;
6) Sound engineering calculations (must include documentation);
7) Worksheet Number; for example, 2.7 means Haul Road Worksheets was used.

7) **Emission Factor (Pounds/Unit):** This figure is the factor that must be provided for each pollutant released at the emission point described. If Continuous Emission Monitoring, Stack Test, or Mass Balance was used as the emission source, then supporting documentation **MUST** be supplied to verify the emission factor.

8) **Ash or Sulfur %:** This entry is REQUIRED ONLY IF there is an Ash or Sulfur Flag (A or S) accompanying the SCC for this process. If applicable, enter the Ash or Sulfur Content of a fuel used in a combustion process. This content is usually expressed as a percentage of the fuel by weight. If the same fuel type but with different Ash and/or Sulfur Contents was used in the same combustion process during a calendar year, then a weighted average of the ash or sulfur percentage must be calculated using Form 2.1, Fuel Combustion Worksheet. Ash and sulfur percentages should be available from your fuel supplier. When calculating emissions, be sure to use the ash/sulfur percent; **do not convert to the decimal equivalent.** (See example calculation under Section 10, Method 2.) The shaded boxes in Block 8 on Form 2.0 do not need to be completed.

9) **Overall Control Efficiency (%):** An overall control efficiency for each class of pollutant will be determined using the following formula:

Overall Control Efficiency for x = (CP x CE_x) ÷ 100

Where x = a class of pollutant (PM_{10}, SO_x, NO_x, VOC, CO, Lead, or HAP)
CP = Capture Efficiency of the Control Device
CE_x = Control Efficiency for that Class of Pollutants

Example: A control device has a Capture Efficiency of 50%, and destroys 75% of the VOCs it captures.

CP = 50%
CE_{VOC} = 75%
Overall Control Efficiency for VOCs = (50 x 75) ÷ 100
= 3750 ÷ 100
= 37.5 %

A pollutant should have an overall control efficiency **ONLY** if there is a control device in block 3 of Form 2.0 (or on Form 2.0C) that controls that particular class of pollutants.

Multiple Control Devices

If more than one control device applies to the same pollutant at an emission point, the combined overall control efficiency needs to be calculated. This can be done several different ways, depending on the configuration of the control devices.

A) If each control device has its own separate intake, then each control device will use its own capture efficiency.

B) If the control devices are in series, the capture efficiency of the first device in the series is used to determine the overall control efficiency for the entire series. The following formula can be used to determine overall control efficiencies for devices in series.

Combined Control Efficiency = $\{CE_1 + CE_2 - [(CE_1 \times CE_2) \div 100]\} \times CP_1/100$

where CE_1 = Control Efficiency for First Device in the Series
CE_2 = Control Efficiency for Second Device in the Series
CP_1 = Capture Efficiency for First Device in the Series

Example: When two devices in series are used to remove the pollutant PM10 from the same emission point, the control efficiencies must be combined. For example, if the first device has a capture efficiency of 75% and a control efficiency of 50% for PM10 and the second device has an efficiency of 80% for PM10, the calculation of combined efficiency is as follows:

Combined Control Efficiency = {50 + 80 - [(50 x 80) ÷ 100]} x (75 ÷ 100)
= {130 - [4000 ÷ 100]} x .75
= {130 - [40]} x .75
= 90 x .75
= 67.5%

Thus, the combined control efficiency for PM10 at this emission point would be 67.5%

C) If control devices are in a configuration other than the two listed above, you may provide documentation for your facilities control devices. This documentation should show your calculations for the overall control efficiency for each class of pollutant at this point. If you have any questions call the Missouri Air Pollution Control Program at (573) 751-4817.

10) **Actual Emissions (Tons/Year):** This is the amount in tons per year of the pollutant emitted at the emission point described. All figures should be rounded to two decimal places. There are two possible formulas.

Method 1: If the Ash or Sulfur Percent is not given, use the following formula:

Actual Emissions = Annual Throughput x Emission Factor
x [(100 - Overall Control Efficiency) ÷ 100] ÷ 2000.

Example: Assume the Annual Throughput is 30,000 tons of grain processed, the PM10 emission factor is .91 pounds of PM10 emitted per ton of grain processed and a PM10 control device for this emission point has an efficiency of 90%. Using the formula above:

Actual Emissions = 30,000 x .91 x [(100 - 90) ÷ 100] ÷ 2000
= 27,300 x [10 ÷ 100] ÷ 2000
= 27,300 x [.1] ÷ 2000
= 2,730 ÷ 2000
= 1.365 tons of PM_{10} emitted per year

Enter 1.37 in the PM10 box in Block 10, Actual Emissions, on Form 2.0.

Note: If no control devices were used, the Control Efficiency equals 0% and the annual PM10 emissions would be 13.65 tons.

Method 2: If the Ash or Sulfur Percent is greater than 0, the following formula must be used:

Actual Emissions = Annual Throughput x Emission Factor x Ash/Sulfur %
x [(100 - Percent Control Efficiency) ÷ 100] ÷ 2000.

Example: Assume the Annual Throughput is 10,000 tons of fuel burned, the SO_x emission factor is 30 pounds of SO_x emitted per ton of fuel burned, the Sulfur Content of the fuel is 1.7% and the SO_x control device has an efficiency of 50%. Using the previous formula:

Actual Emissions = 10,000 x 30 x 1.7 x [(100 - 50) ÷ 100] ÷ 2000
= 300,000 x 1.7 x [50 ÷ 100] ÷ 2000
= 300,000 x 1.7 x [.5] ÷ 2000
= 510,000 x [.5] ÷ 2000
= 255,000 ÷ 2000
= 127.50 tons of SO_x emitted per year

You would enter 127.50 tons in the SO_x box in Block 10, Actual Emissions, on Form 2.0.

THE REST OF THE INSTRUCTIONS ARE FOR INFORMATIONAL PURPOSES ONLY. YOU ARE NOT REQUIRED TO COMPLETE ANY PORTION OF THE SHADED BLOCKS FOR THE EMISSIONS INVENTORY.

YOU ARE NOT REQUIRED TO COMPLETE ANY PORTION OF THE SHADED BLOCKS at the lower right-hand corner of Form 2.0. These blocks are intended for state or local air pollution control agency use in calculating potential emissions. However, if you wish to calculate the potential at your facility, the applicable definitions and formulas are as follows:

Potential Emissions are those emissions that would result if a facility operated at 100% of its rated capacity for 24 hours per day on a year-round basis.

Maximum Hourly (Lbs/Hr) =

Maximum Hourly Design Rate x Emission Factor

Potential Controlled includes the effect of ALL applicable air pollution control measures.

Potential Controlled Emissions -- Annual (Tons /Yr) =

Maximum Hourly Design Rate x Emission Factor x Ash/Sulfur % x 8760 hours/year x [(100 - Overall Control Efficiency) ÷ 100] ÷ 2000 lb/ton

Potential Uncontrolled does NOT INCLUDE the effect of any air pollution control measures.

Potential Uncontrolled Emissions -- Annual (Tons/Yr) =

Maximum Hourly Design Rate x Emission Factor x Ash/Sulfur % x 8760 hours/year ÷ 2000 lb/ton

NOTE: The above potential calculations do not allow for any federally-enforceable permit conditions.